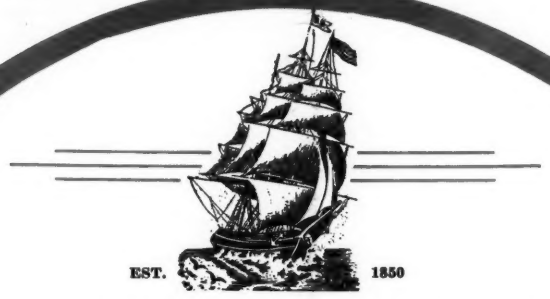
The American Fertilizer

Vol. 93 DECEMBER 21, 1940 No. 13



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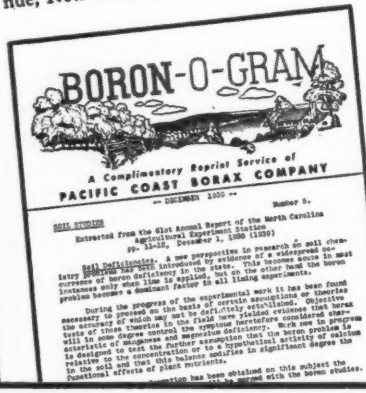
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-- DECEMBER 1930 --

Number 5.

SOIL STUDIES

Extracted from the 41st Annual Report of the North Carolina Agricultural Experiment Station
pp. 41-43, December 1, 1928 (1929)

Soil Deficiencies. A new perspective in research on soil chemistry problems has been introduced by evidence of a widespread occurrence of boron deficiency in the state. This becomes acute in most instances only when lime is applied, but on the other hand the boron problem becomes a dominant factor in all liming experiments.

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Vol. 93 DECEMBER 21, 1940 No. 13

The President's Address

By JOHN E. SANFORD

President, The National Fertilizer Association, Sixteenth Annual Southern Convention, Atlanta, Georgia, November 19, 1940

SINCE our convention here in Atlanta last year about this time, the political and economic face of the World has been changed so much that we can scarcely recognize it.

In early June when we met at White Sulphur Springs, the battle of the Somme was just beginning, and France was still France, though perhaps mortally wounded.

Between early April and late June of 1940—in less than 90 days—Norway, Denmark, Holland, Belgium, and France were brought under Axis domination by war. In recent weeks Rumania, Hungary, Yugoslavia, and Bulgaria, the bread basket of Europe outside of Russia, have been brought into line without war. Meanwhile, too, Russia has defeated Finland and absorbed Latvia, Estonia, and Lithuania, as well as the rich Rumania province of Bessarabia.

In our own land we have launched a stupendous defense program, resorted to peacetime conscription.

My purpose in this quick review of a shifting world is to call to your minds what has already taken place, and to emphasize the fact that not only our industry but our lives may suffer fateful changes in the coming years.

Our industry is basic to American agriculture. Every company in the industry and every responsible man in each company must do their part to serve the needs of the nation in the right way.

Our industry stands ready in every way to do its part in the program of national defense. We are prepared to furnish all the plant food needed for the production of the crops necessary to that program.

Farm income is reported to be $9,000,000,000 in 1940, with estimates of the U. S. Department of Agriculture running higher for 1941. If realized, this will be the highest since 1929 and will probably bring some increase in fertilizer consumption over 1940. Consumption for the last four years has been relatively high, averaging about 7,750,000 tons.

While some upward price pressures are appearing in the fertilizer material market, this is to be expected by reason of advancing costs and the low general level of prices that has prevailed.

For the past six years our industry has been the victim of government competition. One governmental agency has been producing and selling one of our principal products—superphosphate—to a considerable extent at taxpayers' expense, in direct competition with private enterprise. Another governmental agency has been distributing this production and additional commercial production purchased at rock-bottom prices through the purchasing power of the government. Except for transportation, the cost of distribution is largely paid by the taxpayers; land grant freight rates, applicable only to government property, are utilized; all to the end that the material is charged to the farmer at a fictitiously low cost.

A new phase of government competition faces us because of a nitrogen fixation plant that has been authorized under the guise of the defense program for construction and operation by TVA at Muscle Shoals. Further discussion of these activities will be had during the course of our convention program.

The Department of Justice investigation of the industry continues before the grand jury

at Winston-Salem. You will recall that this nation-wide investigation really began in February 27, 1939, and that the first hearings covered a period of months before a grand jury in New York. The North Carolina continuation of the inquiry began on February 12, 1940. Hundreds of witnesses and the files of scores of producers have been examined during the past 20 months. Positive information is, of course, not available, but present indications are that the investigation will be concluded within the next month or six weeks.

In these troublesome times our industry conduct should be such as to give consideration to our national unity and well-being as well as individual company success. Only by so doing can we hope to further our industry welfare and our individual prosperity.

NEW NATURAL NITRATE FILM

A new talking motion picture in full natural color showing interesting parallels between the food requirements of plants, animals and people has just been released by the Chilean Nitrate of Soda Educational Bureau. Showings of the picture, the title of which is "The Magic Desert," and "Vitamin Elements in Plant Feeding," will be made over a wide area.

The new picture is in two distinct parts. In the second portion of the film, the effects on crops of various plant food deficiencies are shown in natural colors. So far as is known, the new Natural Nitrate film is the first made which actually identifies and pictures these deficiencies just as they appear in plants in the field. Thus the motion picture should help farmers to recognize the deficiency symptoms and conditions in their own crops.

The "Magic Desert" portion of the film, also entirely in natural color, shows new and interesting scenes in connection with the mining, refining, transportation and use of Natural Chilean Nitrate. Highlights of this portion of the picture are photographs, made this year, of crops growing in the 97th year of a continuous experiment at the world-famous Rothamsted Experiment Station. During the 97 years of continuous cropping all the nitrogen in the fertilizer used came from Natural Nitrate of Soda. A striking battle with a giant marlin in the waters off the coast of Chile provides thrills for sports lovers.

State Managers for Chilean Nitrate Educational Bureau, Inc., are now arranging special showings of the new picture to farm audiences, to groups of agricultural workers, and to fertilizer agents.

Crop Production, 1940

The Agricultural Marketing Service's after-harvest survey of acreage and yields obtained on individual farms shows that production of many crops has exceeded earlier expectations. Yields per acre have averaged higher than in any previous year, and total crop production—on an acreage smaller than a few years ago—has been larger than in any years except 1937. Crop production, although only slightly above the average of the last three remarkable seasons, appears high when compared with production in previous years and particularly high when compared with averages for periods that include the drought years 1934 and 1936. Unlike the big crops of 1937, which came when reverses were greatly depleted, the 1940 crops were harvested after three good years so supplies of some products are much higher than the production figures alone would indicate.

Loss of acreage from crop failure has been less than in 7 of the last 9 years. The acreage remaining for harvest was 2 per cent above last year, but nearly 6 per cent below the usual level of total acreage harvested before the droughts of the 1933-36 period. The smaller 1940 acreage was more than offset by good yields.

The 1940 yield record is outstanding. Tobacco, for example, averaged 965 pounds per acre or 45 pounds higher than last year and over 60 pounds more than in any other previous year. Potato yields averaged just above 130 bushels, whereas no previous crop has reached 125 and only five other crops have passed the 120 mark. Cotton averaged 252 pounds or over half a bale per acre, although this was only a few pounds above the average of the excellent yields of the last three seasons, it was 29 pounds above the highest yield obtained prior to 1937, and 48 per cent above the average of the 1923-32 or pre-drought period when boll weevil damage was severe. The peanut yield of 845 pounds set a new high mark, only one other crop having passed 800 pounds. Sugar beets, at 13 tons per acre, are a half ton higher than in 1938 and more than a ton higher than in other years.

Oats and flaxseed show the highest yields since 1915. Corn, wheat, and hay, which together make up nearly two-thirds of the total acres of crops, gave good but not outstanding yields. Citrus groves of bearing age are expected to show a yield of nearly 7 tons of oranges, grapefruit and lemons per acre, which

would be only 1 per cent below the record yield from the bloom of 1937. As the present forecast includes some fruit which is now on the trees but will not be picked till the fall months of 1941, the yield may still exceed previous records if losses from freezing and other causes are light. Practically all of the principal or million-acre crops, except grain sorghums, show better yields than in either the ten-year period ending with 1938 or the ten years before the drought of 1933. In portions

(Continued on page 26)

Crop	Production (in thousands) Average, 1929-38	1939	1940
Corn, all, bu.	2,299,342	2,602,133	2,449,200
Wheat, all, bu.	754,685	751,435	816,698
Winter, bu.	571,067	569,741	589,151
All spring, bu.	183,619	181,694	227,547
Durum, bu.	29,619	34,264	34,776
Other spring, bu.	154,000	147,430	192,771
Oats, bu.	1,024,852	935,942	1,235,628
Barley, bu.	225,486	274,767	309,235
Rye, bu.	38,095	39,049	40,601
Buckwheat, bu.	7,617	5,669	6,350
Flaxseed, bu.	10,846	20,152	31,127
Rice, bu.	44,254	53,722	52,754
Grain sorghums,[1] bu.	84,148	83,264	121,371
Popcorn, lb.	....	78,616	57,181
Cotton, lint, bales	13,547	11,817	12,686
Cottonseed, tons	6,023	5,260	5,645
Hay, all, tons	78,948	85,124	95,156
Hay, all tame, tons	69,650	76,099	86,312
Hay, wild, tons	9,298	9,025	8,844
Sweet sorghums,[2] tons	4,074	8,704	13,816
Alfalfa seed, bu.	979	1,488	1,453
Red clover seed, bu.	1,106	1,798	1,994
Alsike clover seed, bu.	355	319	422
Sweetclover seed, bu.	804	1,418	901
Lespedeza seed, lb.	57,982	145,371	159,120
Timothy seed, bu.	1,725	1,418	1,313
Beans, dry edible, bags[3]	13,086	14,388	16,074
Peas, dry field, bu.	4,288	3,822	3,812
Soybeans for beans, bu.	27,318	91,272	79,837
Cowpeas for peas, bu.	6,778	8,661	8,712
Peanuts picked and threshed, lb.	1,035,243	1,179,505	1,611,635
Velvet beans,[1] tons	773	850	1,036
Potatoes, bu.	366,949	363,159	397,722
Sweet potatoes, bu.	72,436	72,679	61,998
Tobacco, lb.	1,360,661	1,858,364	1,376,471
Sorgo sirup, gal.	13,061	10,230	11,865
Sugarcane for sugar, tons	4,439	6,244	4,551
Sugarcane sirup, gal.	21,428	24,909	14,809
Sugar beets, tons	8,937	10,781	11,969
Maple sugar, lb.	1,437	760	629
Maple sirup, gal.	2,627	2,515	2,628
Broomcorn, tons	43	31	41
Hops, lb.	[4]34,310	[4]37,932	[4]41,772
Apples, com'l crop, bu.	121,755	[4]143,085	[4]115,456
Peaches, total, bu.	[4]52,723	[4]61,072	[4]52,772
Pears, total, bu.	[4]26,333	[4]31,047	[4]32,188
Grapes, total,[5] tons	[4]2,220	2,526	2,482
Cherries (12 states), tons	[4]129	[4]187	168
Plums (2 states), tons	[4]67	[4]77	[4]76
Prunes, used fresh (3 states), tons	49	58	49
Prunes, canned (2 states), tons	19	32	16
Prunes, dried (3 states), tons	226	213	199
Oranges (7 states), boxes	56,125	75,646	81,887
Grapefruit (4 states), boxes	21,958	34,975	40,364
Lemons (Calif.), boxes	8,233	11,963	13,430
Cranberries (5 states), barrels	590	704	571
Pecans (12 states), lb.	63,430	63,639	87,286
COMMERCIAL TRUCK CROPS:			
Artichokes (Calif. only), boxes	875	1,122	848
Asparagus			
For market, crates	5,382	6,882	7,831
For processing (Calif. only), tons	52.8	47.6	53.9
Beans, lima			
For market, bu.	714	1,140	975
For processing, tons	16.5	29.8	25.7
Beans, snap			
For market, bu.	[4]12,076	[4]16,871	[4]15,153
For processing, tons	81.5	94.1	100.8
Beets			
For market, bu.	[4]1,942	2,021	2,025
For processing, tons	43.7	44.7	71.1
Cabbage, total, tons	[4]1,134.4	[4]1,143.4	1,314.2
For market, tons	[4]976.4	[4]996.8	1,136.0
For kraut, tons	158.0	146.6	178.2
Cantaloups, crates	[4]14,890	14,402	[4]13,313
Carrots, bu.	[4]12,560	16,061	17,226
Cauliflower, crates	[4]7,284	9,027	10,006
Celery, crates	[4]9,525	11,527	12,756
Corn, sweet			
For market (N. J. only), ears	116,020	114,400	112,320
For processing, tons	676.1	661.1	725.6
Cucumbers			
For market, bu.	[4]4,171	[4]4,656	4,656
For pickles, bu.	5,361	4,000	6,052
Eggplant, bu.	822	1,092	634
Kale (Virginia only), bu.	598	550	243
Lettuce, crates	[4]19,536	[4]24,004	[4]22,536
Onions, sacks	[4]14,157	[4]17,840	[4]15,397
Peas			
For market, bu.	[4]7,690	[4]9,726	[4]8,549
For processing, tons	204.1	198.1	306.1
Peppers, bu.	4,068	5,066	4,769
Pimientos for processing, tons	17.4	23.2	11.7
Spinach			
For market, bu.	[4]12,603	[4]13,275	[4]12,514
For processing, tons	48.8	47.2	31.0
Tomatoes			
For market, bu.	[4]19,584	24,754	[4]23,705
For processing, tons	1,533.2	1,999.9	2,080.1
Watermelons, melons	[4]68,900	[4]66,203	[4]79,428
Garlic, sacks	[6]157	193	153
Peppermint, lb.[7]	902	876	965
Potatoes, early, bu.	[4]40.770	[4]44,533	50,080
Shallots (La. only), bu.	[4, 6]605	[4]674	596
Strawberries, crates	[4]11,176	[4]13,624	[4]14,314

[1] All purposes.
[2] For hay and forage, but not included in tame hay.
[3] Bags of 100 pounds (uncleaned).
[4] Includes some quantities not harvested.
[5] Production includes all grapes for fresh fruit, juice, wine, and raisins.
[6] Short-time average. [7] Pounds of oil.

The Influence of Placement upon the Movement of Fertilizer Salts in the Soil*

By J. M. BLUME, M. M. PARKER and E. R. PURVIS
Virginia Truck Experiment Station, Norfolk, Virginia

ALTHOUGH the benefits derived from the band placement of fertilizer have been demonstrated for a number of crops, very little data have been presented regarding the effect of placement upon the movement of fertilizer salts in the soil. The brief study reported here presents data relative to this question.

Experimental Procedure

The soil employed in this study is classed as a Woodstown sandy loam. The plats from which the samples were taken were 1/30 acre in size and consisted of six rows 30 inches apart, five of which had received 6-6-5 fertilizer, each by a different method of application, for a period of 4 years. One row of each plat received no fertilizer during this time. Snap beans were growing on the plats during the period of this study, this being the fifth crop since the placement tests were begun in 1936.

The beans were fertilized with a 6-6-5 fertilizer mixture at the rate of 1,000 pounds per acre. Superphosphate and muriate were the sources of phosphate and potash, while the nitrogen was obtained in equal parts from sulphate of ammonia, nitrate of soda, Agramon and tankage. The fertilizer was applied and the beans planted on August 23, 1940.

Three rows of beans, each receiving a different treatment, were selected for the study, the treatments being as follows:

1—No fertilizer applied.

2—Fertilizer applied by hand in a 12-inch strip in the row and worked into the soil immediately before planting.

3—Fertilizer applied in bands, 2 inches to each side, and 2 inches below seed level at time of planting with a revolving cylinder top delivery fertilizer distributor attached to the planter.

Soil samples were drawn on August 28th, September 11th, September 27th, and October 18th. Samples were taken at 0, 2, 7, and 14-inch distances from the plants at depths of 0 to 4 inches, 4 to 8 inches, and 8 to 12 inches (except at the 14-inch distance). Each sample consisted of 5 cores drawn at intervals along a single row, and similarly treated rows were sampled in each of four replicated plats.

The soil samples were taken into the laboratory, air dried, and the soluble salt content determined by means of a simple home-constructed conductivity apparatus. This apparatus was calibrated with soluble salts obtained by water extraction of soil taken from both fertilized and unfertilized plots in the field used in this investigation. The results obtained for the 0 to 4-inch depth are reported in parts per million of soluble salts in Fig. 1.

The data for the lower depths are not included since no evidence of fertilizer movement below the 4-inch depth was obtained. Only 3.88 inches of rainfall during the period of the study. Although this was sufficient for optimum growth of the beans, it was below normal for this time of the year and probably accounts for the lack of movement of the fertilizer into the lower depths.

The data presented in Fig. 1 show that fertilizer applied by the band placement method has remained concentrated in the band for a period of 19 days after planting. Soil samples taken from between the bands show only a small increase in salt concentration during this time. This is one of the most important advantages derived from the band placement method since it is during the period of germination, and the early stages of growth, that plants are most susceptible to injury by fertilizer salts. At the end of 35 days, the data show that the soluble salts have moved into the center of the row and this area now has a higher salt concentration than the zone in which the fertilizer was placed. In addition to the movement of salts from the zone of the band, it is likely that fixation of phosphate, and plant removal of this and other nutrients, have played a part in the reduction of the soluble salt content in this area. The samples taken at the end of 53 days show a general leveling off of the soluble salt content from the center of the row out to a distance of 7 inches, and a further loss in total salts present due to crop utilization.

When the data for the "in row" placement

* A paper presented before the Joint Committee on Fertilizer Application, Chicago, December 2, 1940.

are compared to those for band placement, a marked contrast is seen. Here the salt concentration in the row has remained high throughout the period of the study. Although no injury to germination was noted, plant injury, as evidenced by retarded growth, was apparent within two weeks after the plants came up. When harvested, this treatment produced only 80 per cent as many beans as did the band placed treatment.

The data for the unfertilized rows show a general low level of fertility and a tendency towards a gradual reduction of the soluble salt content in the root zone as nutrients were removed by the plants. These rows produced 60 per cent as many beans as did the rows receiving the band placed treatment.

In order to determine the effect of time upon the movement and availability of the individual nutrients, samples from the 0 to 4-inch depth from the band placed and in row treatments were analyzed by the rapid soil test method of Hester, Blume and Shelton. The results obtained are presented in Tables 1 and 2.

When the data of Table I are compared to those of Table 2, certain significant differences are noted. A fair test for phosphorus was obtained in the zone of the band, 19 days after the fertilizer was applied. At this time, the applied phosphate had all been fixed in the "in row" treatment. The first sample taken from the center of the row of the "in row" treatment showed only a fair test for phosphorus, indicating that, although the fertilizer salts had been concentrated in this zone, in the process of working the fertilizer into the soil there had been sufficient mixing with the soil to fix most of the phosphate. Samples taken from the band-placed treatment at this time showed a considerably higher amount of available phosphorus in the zone of the band. In neither treatment was there any indication of movement of phosphate. Because of the high fixing power of this soil for phosphate, no movement of phosphorus would be expected.

The data for available potash in both treatments are in close agreement with the salt concentration values shown in Fig. 1. In the

(Continued on page 24)

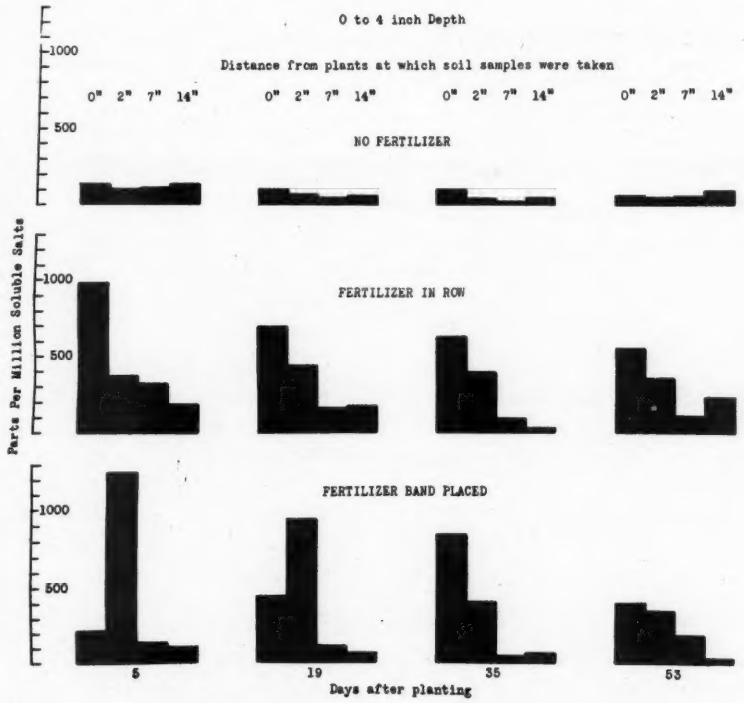

FIG. 1. Effect of fertilizer placement upon the distribution of soluble salts in the soil.

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December Cotton Report

A United States cotton crop of 12,686,000 bales is forecast by the Crop Reporting Board of the Agricultural Marketing Service. based upon indications of December 1, 1940. This is a decrease of about one per cent from the forecast as of November 1st, and compares with 11,817,000 bales ginned in 1939, 11,943,000 bales in 1938, and 13,547,000 bales, the 10-year (1929-38) average. The indicated yield per acre for the United States of 252.4 pounds compares with 237.9 pounds in 1939, 235.8 pounds in 1939, 235.8 pounds in 1938, and 198.1 pounds. the 10-year (1929-38) average.

In the area from Georgia to Texas the development of late bolls was seriously retarded by adverse weather during November. Freezes in the middle of the month, and rains in some areas during the latter part were especially detrimental because of the lateness of the crop. The resulting losses during November totaled 212,000 bales in the States of Georgia, Alabama, Mississippi, Arkansas, Oklahoma and Texas.

Harvested acreage is now estimated at 24,078,000 acres, which is 1.1 per cent more

State	Production (Ginnings)[1] 500 lb. gross wt. bales: Average, 1929-38 1,000 bales	1939 Crop 1,000 bales	1940 Crop (Dec. 1 est. 1,000 bales
Missouri	270	437	380
Virginia	37	13	25
N. Carolina	658	457	740
S. Carolina	820	871	970
Georgia	1,175	915	1,020
Florida	34	11	20
Tennessee	472	449	515
Alabama	1,200	785	790
Mississippi	1,619	1,582	1,280
Arkansas	1,283	1,413	1,540
Louisiana	709	745	455
Oklahoma	812	526	805
Texas	3,876	2,846	3,285
New Mexico	99	102	123
Arizona	154	202	195
California	315	443	525
All other	15	20	18
UNITED STATES	13,547	11,817	12,686
Sea Island[2]	...	1.7	4.1
Amer. Egyptian[2]	17	28	37
Lower Calif. (Old Mexico)[3]	42	40	54

[1] Allowances made for interstate movement of seed cotton for ginning. Not including production of linters.

[2] Included in State and United States totals. Sea Island grown principally in Georgia and Florida. American Egyptian grown principally in Arizona.

[3] Not included in California figures, nor in United States total.

than the 23,805,000 acres harvested in 1939. The December 1st estimate is about 1.3 per cent less than the acreage estimate used in preparing the reports for September, October and November. Allowing for the estimated abandonment of 4.0 per cent, the cotton acreage in cultivation on July 1st is indicated to have been 25,073.000 acres. The abandonment in 1940 was greater than average, some acreage having been removed by farmers after July 1st in order to be in compliance with the Agricultural Conservation Program.

Harvesting and ginning of the 1940 cotton crop are later than in any recent year. A smaller percentage of the crop was ginned up to December 1st than in any year since 1926. Of recent crops only the record large crop of 1937 approached this year in lateness of harvest and ginning. A considerable percentage of the crop still remains to be harvested and ginned in Missouri, Oklahoma, Arkansas, Mississippi and Tennessee. The California crop on the other hand is much earlier than average and in the Carolinas and Virginia about an average proportion of the crop has been ginned.

The report of the Bureau of the Census shows 10,870,247 running bales (counting round as half bales) ginned from the crop of 1940 prior to December 1st, compared with 11,110,486 for 1939 and 11,230,522 for 1938.

Census of Fertilizer Manufacturers 1939

(Preliminary Report)

Manufacturers of fertilizers reported a slight decrease in production and a moderate decrease in employment and wages for 1939 as compared with 1937, according to preliminary figures compiled from returns of the Census of Manufactures for 1939 and released on December 14th by Director William Lane Austin, Bureau of the Census, Deaprtment of Commerce.

This industry, as constituted for census purposes, includes establishments primarily engaged in the manufacture of commercial fertilizers and superphosphates, or mixing of fertilizer materials.

The wage earners primarily engaged in manufacturing in this industry in 1939, were 18,744, a decrease of 10.3 per cent compared with 20,893 reported for 1937, and their wages, $13,678,397, were less than the 1937 figure, $15,364,169, by 11 per cent. These decreases may be partially accounted for by the fact that the 1939 Census of Manufactures questionnaire, for the first time, called for personnel employed in distribution, construction, etc., separately from the manufacturing employees of the plants. It is not known how many of the wage earners reported for 1937 were engaged in distribution and construction and how many were engaged in manufacturing. Employees of the plants reported as engaged in distribution and construction activities in 1939 are not included in this preliminary report but will be included in the final report.

The value of products of the industry for 1939 amounted to $185,684,328, a decrease of 5.1 per cent compared with $195,759,025 reported for 1937.

Summary statistics for the industry for 1939 and 1937 are presented in the following table. All figures for 1939 are preliminary and subject to revision. Detailed statistics on production will be given in a later report.

Summary for the Fertilizer Industry, 1939 and 1937

(Because they account for a negligible portion of the national output, plants with annual production valued at less than $5,000 have been excluded since 1919)

	1939	1937	Per Cent of Increase or Decrease (—)
Number of establishments	764	743	2.8
Salaried personnel[1]	2,666	3,349	—20.4
Salaries[1, 2]	$5,251,099	$6,369,901	—17.6
Wage earners (average for the year)[3]	18,744	20,893	—10.3
Wages[2, 3]	$13,678,397	$15,364,169	—11.0
Cost of materials, supplies, fuel, purchased electric energy, and contract work[2]	$128,629,745	$130,080,550	—1.1
Value of products[2]	$185,684,328	$195,759,025	—5.1
Value added by manufacture[4]	$57,054,583	$65,678,475	—13.1

[1] No data for employees of central administrative offices are included.

[2] Profits or losses cannot be calculated from the census figures because no data are collected for certain expense items, such as interest, rent, depreciation, taxes, insurance, and advertising.

[3] The item for wage earners is an average of the numbers reported for the several months of the year and includes both full-time and part-time workers. The quotient obtained by dividing the amount of wages by the average number of wage earners should not, therefore, be accepted as representing the average wage received by full-time wage earners.

[4] Value of products less cost of materials, supplies, fuel, purchased electric energy, and contract work.

Facts—Our Industry's Best Protection*

By MAURICE H. LOCKWOOD
Eastern States Farmers' Exchange, Springfield, Mass.

Fertilizer Prices

THE United States Department of Agriculture reports[1] that fertilizer prices are considerably lower than prices of most commodities purchased by farmers. According to the records of the Department, fertilizer prices average ninety-six per cent of the 1910 to 1914 average while the average for all other commodities purchased by farmers is one hundred and twenty-two per cent, or twenty-seven per cent higher than fertilizer. Clothing prices have advanced twenty-five per cent, building materials fifty-two per cent, farm machinery fifty-two per cent, equipment and supplies nine per cent as compared with the four per cent decrease in fertilizer prices. Fertilizer prices are now twenty-five per cent lower than they were in 1929.

We may well recall also that the plant nutrient content of fertilizers has been increased eleven per cent while the average price decreased twenty-five per cent from 1929 to 1940. This is no small contribution to the welfare of agriculture in which we are so vitally concerned. The Department of Agriculture has stated that there has been a material improvement in the quality of commercial fertilizers while fertilizer prices have declined considerably. During the ten years from 1930 to 1940, an average ton of fertilizer has increased nine per cent in plant nutrient content and during the twenty years since 1920 has increased forty per cent.

Too frequently we hear or read that some consumer, or even a Government official, is critical of fertilizer prices. Such mis-statements are, no doubt, usually based on sincere beliefs and lack of factual information. Not long ago I had the experience of hearing a Government official make the statement on the radio that the price of fertilizer had remained "on an even line during the early years of the depression while everything the farmer sold was dropping."[2] Having in mind the trend in prices of fertilizers in one section of the country, I was doubly pleased to find that statistics for the country at large confirmed in general the records of my own organization that fertilizer prices had dropped rather sharply from 1929 through 1933. Nationally, this drop averaged twenty-six per cent.

In 1939, farmers in the eastern part of the United States spent on an average four and four-tenths cents of each dollar of farm income for fertilizer. If the price of fertilizer had been the same as in 1929, the same amount of fertilizer would have taken five and eight-tenths cents of each dollar of farm income. If the price had been the same as in 1920, eight and two-tenths cents would have been required

* An address before the Sixteenth Annual Southern Convention of The National Fertilizer Association, Atlanta, Ga., November 19, 1940.

[1] Statistics from Agricultural Marketing Service, United States Department of Agriculture.

[2] Statement made by Thurman Arnold, Assistant Attorney General of the United States while answering, during a radio broadcast on July 27, 1940, a question from Donald Montgomery, Consumers' Counsel, of the U. S. Department of Agriculture.

(Continued on page 20)

BRADLEY & BAKER

FERTILIZER MATERIALS - FEEDSTUFFS

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FERTILIZER MATERIALS MARKET

NEW YORK

Market Dull. Manufacturers Not Buying in Advance of Current Needs. Export Market Also Slackens. Freight Facilities Scarce.

Exclusive Correspondence to "The American Fertilizer."

NEW YORK, December 16, 1940.

The market on raw fertilizer materials here is extremely dull and, if anything, there seems to be a slackening of activity over recent weeks. It is quite evident that manufacturers are not inclined to order materials too far ahead and they are apparently going on the theory of maintaining adequate stocks for present demands only.

The export market also reflects a tone of dullness with foreign inquiries few and far between.

Nitrate of Soda

$29.40 per ton in 100-lb. bags, $28.70 in 200-lb. bags and $27.00 in bulk, all f.o.b. port warehouse. Shipments against contract moving normally and ample supplies on hand of both domestic and foreign material.

Sulphate of Ammonia

Price still very firm at schedule and no easing up is to be noted in this market. Foreign call still remains.

Superphosphate

Although this market is at present quiet, price remains steady at 55 cents per unit, producing points, for ordinary superphosphate. Triple superphosphate is still in very good demand and continues to be very tight.

Potash

All prices are firm and unchanged. Shipments against contract are moving in good volume and the outlook for future domestic supplies is good.

Dried Blood

This market continues to be slow with buyers showing little interest. In spite of this, sellers are in a comfortable position and continue to hold price at $2.50 ($3.04 per unit N), f.o.b. South American blood is available at $2.40 ($2.91½ per unit N), c.i.f., but here, too, interest is very light.

Tankage

Some local production 8/9 per cent unground material is offered at $2.50 ($3.04 per unit N) and 10 cents, f.o.b., but buyers show no interest at this level. Foreign offerings are scarce, due to lack of available freight space.

Nitrogenous Material

No change, with only activity in movement of material against contracts.

Bone Meal

This market is quiet and firm with some South American material 4½ and 50 per cent available at from $32.00 to $33.00 per ton, c.i.f.

Fish Scrap

No activity to be noted here, since supplies are extremely light. The menhaden meal market at Baltimore is strictly nominal, since there are no stocks.

BALTIMORE

Holiday Lull in Market. Little Change in Prices. Sulphate of Ammonia and Potash Materials Still Scarce.

Exclusive Correspondence to "The American Fertilizer."

BALTIMORE, December 17, 1940.

The usual between-season and holiday lull is now on and interest in fertilizer materials is practically at a standstill. In spite of this, however, there is practically no change in the markets on the various ingredients, and probably will not be much activity until considerably after the turn of the year.

Ammoniates.—The market on feeding materials has eased up slightly and ground animal tankage ranges from $2.75 to $2.90 per unit of nitrogen. The market on South American ground dried blood figures about $2.90 per unit of nitrogen, c.i.f. Baltimore.

FERTILIZER MATERIALS

LET US QUOTE YOU ON YOUR REQUIREMENTS OF THESE MATERIALS

✤

PHOSPHATE ROCK
✤
SUPERPHOSPHATE
✤
DOUBLE SUPERPHOSPHATE
✤
NITRATE *of* SODA
✤
SULPHURIC ACID
✤
SULPHATE *of* AMMONIA
✤
BONE MEALS
✤
POTASH SALTS
✤
DRIED BLOOD
✤
TANKAGES
✤
COTTONSEED MEAL
✤
BONE BLACK
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East St. Louis, Ill.
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Havana, Cuba
Houston, Texas
Jacksonville, Fla.
Montgomery, Ala.
Nashville, Tenn.
New Orleans, La.
New York, N. Y.
Norfolk, Va.
Presque Isle, Me.
San Juan, P. R.
Sandusky, Ohio
Wilmington, N. C.

Nitrogenous Material.—The market is unchanged and is still nominally quoted at $2.55 to $2.65 per unit of nitrogen, f.o.b. Baltimore.

Sulphate of Ammonia.—This material continues to be in short supply, but the export demand continues strong and is now in the neighborhood of $41.00 to $41.50 per ton, in double bags, f.a.s. Baltimore.

Nitrate of Soda.—The market on Chilean nitrate of soda continues at $29.40 per ton of 2,000 lb., in 100-lb. bags, ex port warehouse, with usual differential for 200-lb. bags and in bulk. The demand, as usual at this time of the year, is light.

Fish Scrap.—The market is entirely clear of menhaden fish, ground or unground, and such limited offerings of fish meal as are obtainable are firmly held at $58.00 per ton, in 100-lb. bags, f.o.b. Baltimore.

Superphosphate.—Manufacturers continue to quote run-of-pile at $8.00 per ton of 2,000 lb., basis 16 per cent, and $8.50 for flat 16 per cent grade, both in bulk, f.o.b. producers' works, Baltimore, with no immediate change in prospect, although manufacturing costs are gradually increasing.

Bone Meal.—There is very little interest being shown in either raw or steamed bone meal. South American 3 and 50 per cent is quoted at $32.00 to $33.00 per ton, while 4½ and 47 per cent ranges from $31.00 to $32.00 per ton, c.i.f. Baltimore.

Potash.—Deliveries are still being made against contracts booked earlier in the season, but those manufacturers who did not cover for their full requirements will doubtless experience difficulty in securing ample supplies except at a premium. Offerings by second hands are limited, and range from 53½ to 55 cents per unit for muriate.

Bags.—The burlap market is again firmer, and the present price figures about $120.00 per thousand for plain, new 10-oz., basis 40 cut 54 in., f.o.b. Baltimore, for spring delivery.

CHICAGO

Fertilizer Organics Demand Slackens in Spite of Light Stocks. Feed Material Market Weaker.

Exclusive Correspondence to "The American Fertilizer."

CHICAGO, December 16, 1940.

Inquiry for organics has dwindled, and the market, if anything, has an easier cast. No appreciable selling pressure is observed, but lack of buying interest tends to work prices down, especially as occasional offerings of resale material have appeared. These market conditions appear paradoxical when one considers the comparatively strong prices for cottonseed and soy bean meal, and the light stocks of organics in sellers' hands.

The market in feed materials has turned from strength to weakness, owing to large receipts of hogs, and demand for finished goods has not been active; price concessions were therefore freely circulated.

Nominal prices are as follows: High-grade ground fertilizer tankage, $2.40 to $2.50 ($2.91½ to $3.04 per unit N) and 10 cents; standard grades, crushed feeding tankage, $2.65 to $2.70 ($3.22 to $3.28 per unit N) and 10 cents; blood, $2.60 to $2.65 ($3.16 to $3.22 per unit N); dry rendered tankage, 50 to 55 cents per unit of protein, Chicago basis.

JOHN W. BAYNARD

John W. Baynard, superintendent of the Charlotte, N. C., plant of the F. S. Royster Guano Company, died on December 14th after an illness of several weeks. He was 57 years of age and had been connected with the Royster Company for the past 27 years.

Manufacturers' Sales Agents for **DOMESTIC**

Sulphate of Ammonia

Ammonia Liquor :: Anhydrous Ammonia

HYDROCARBON PRODUCTS CO., INC.

500 Fifth Avenue, New York

Changes in A. O. A. C. Official Fertilizer Definitions

At the recent annual meeting of the Association of Official Agricultural Chemists, the Committee on Definition of Terms and Interpretation of Results on Fertilizers presented their report which was adopted by the meeting. The committee was composed of L. S. Walker, Chairman; W. C. Jones, G. S. Fraps, L. E. Bopst and W. H. MacIntire. The changes adopted were as follows:

OFFICIAL, FINAL ACTION

Calcium Nitrate

Calcium nitrate (nitrate of lime) is a commercial product consisting chiefly of calcium nitrate, and shall contain not less than fifteen per cent (15%) of nitrogen.

Ammoniated Superphosphate

Ammoniated superphosphate is the product obtained when superphosphate is treated with ammonia or with a solution containing free ammonia and other forms of nitrogen dissolved therein.

Superphosphate

Superphosphate is a product obtained by mixing rock phosphate with either sulfuric acid or phosphoric acid or with both acids. (The grade that shows the available phosphoric acid shall be used as a prefix to the name. Example: 20 per cent superphosphate.)

The definition of superphosphate on page 734, A. O. A. C. Methods of Analysis, 1940, shall be dropped and the above definition substituted.

SECOND READING AS TENTATIVE

Nitrate of Soda and Potash

Nitrate of soda and potash is a commercial product containing nitrates of sodium and potassium and shall contain not less than 14% of nitrogen (N) and 14% of potash (K_2O).

Guaranteeing in Terms of Elements

All fertilizer components with the exceptions of potash (K_2O) and phosphoric acid (P_2O_5) if guaranteed shall be stated in terms of the elements.

PROPOSED DEFINITION

Magnesium Oxide

Magnesium oxide is a commercial product containing not less than ninety-two per cent (92%) of the oxide of magnesium.

CHILEAN NITRATE EDUCATIONAL BOOKLET

The Chilean Nitrate Educational Bureau has just published a very practical booklet on the use of Chilean nitrate of soda on practically all the southern crops. The booklet, entitled "How to Use Nature's Magic," contains 72 pages and contains recommendations for the use of Chilean nitrate on 89 crops grown in the south. The text is fully illustrated with 73 photographs showing crop demonstration scenes as well as views of the preparation and shipping of this fertilizer material.

In the introductory portion, there is a very clear, non-technical discussion of the "vitamin" elements in plant food and the needs for varying proportions of the so-called "minor elements" in the fertilizer program to combat plant diseases caused by a lack of these elements. Reference is also made to tests over long periods of time at the world's leading agricultural experiment stations. For example, Chilean nitrate has been applied continuously to a rotation of corn, wheat, oats and hay for 97 years at the Rothamsted Station in England, while the Pennsylvania Experiment Station has made similar tests for over 50 years.

Copies of the booklet will be supplied to any farmer or fertilizer manufacturer upon application to the Chilean Nitrate Educational Bureau, 120 Broadway, New York.

PULVERIZED MASCOT LIMESTONE
Trade Mark Registered

MAGNESIUM LIMESTONE
"It's a Dolomite"
American Limestone Company
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HIGRADE MURIATE OF POTASH
62/63% K_2O
Also 50% K_2O Grade
MANURE SALTS
Approximately 30% K_2O
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SUNSHINE STATE POTASH
A PRODUCT OF NEW MEXICO U.S.A.

A NEW call has gone out to the American potash industry! Foreign supplies of this essential element are virtually cut off. Domestic producers must contribute even greater quantities of potash to safeguard this nation's agricultural and chemical requirements.

The United States Potash Company is geared to do its part in the emergency. Ten years ago this Company sank the first shaft of its mine near Carlsbad, New Mexico. Since then, it has worked consistently to free the United States from dependence upon foreign countries for its supply of potash. To meet today's greater need, our operations are keyed to maximum production. Throughout mine and plant, mining and refining equipment is keeping pace with the latest mechanical developments. A skilled and loyal personnel assures the highest peak of operating efficiency. Conscious of our increased responsibility, we pledge ourselves to the task of striving to assure the United States for all time of sufficient domestic supplies of potash.

UNITED STATES POTASH COMPANY, INC., 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

SMALLEY HONORED BY AMERICAN SOCIETY OF AGRONOMY

H. R. Smalley, director of soil improvement work for The National Fertilizer Association, received the highest honor that the American Society of Agronomy confers upon any of its members when he was elected a Fellow at the recent annual meeting of the Society in Chicago. Mr. Smalley's election was based upon his discovery of aluminum toxicity in acid soils while working at the Indiana Experiment Station with J. B. Abbott and S. D. Conner; on his development of cooperative relations between research and industry workers; and on his service on Society committees for many years. In accordance with custom, those elected Fellows were presented at the annual dinner meeting by Dr. L. E. Kirk, of the University of Saskatchewan, Vice-President of the Society. Four persons elected this year were: Dr. L. F. Graber, Head, Department of Agronomy, University of Wisconsin; H. R. Smalley, Director of Soil Improvement Work, The National Fertilizer Association; Dr. F. W. Parker, Agronomist, E. I. duPont de Nemours & Co., Wilmington, Del.; and Dr. Paul C. Mangelsdorf, Professor of Botany and Assistant Director of the Harvard Herbarium, Cambridge, Mass.

SHIRLEY NAMED FREEPORT SULPHUR VICE-PRESIDENT

The Freeport Sulphur Co. has announced the election of R. K. Shirley to the office of vice-president and treasurer. Mr. Shirley entered the service of the company in 1922 as chief clerk to the auditor and advanced successively to the positions of auditor, assistant general manager, assistant vice-president and comptroller, and treasurer. Since 1930 he has made his headquarters at the New York offices of the company.

NOVEMBER SULPHATE OF AMMONIA

Production of by-product sulphate of ammonia continues at somewhat over 2,000 tons per day, according to the figures of the U. S. Bureau of Mines. The output during November amounted to 62,843 tons, a decrease of 1.5 per cent from the October total of 63,806, which can be accounted for by the difference of one day in the length of the months. For the first 11 months of the year, the figures show 652,810 tons produced, compared with 519,638 tons during January-November, 1940.

For by-product ammonia liquor the figures were: 2,496 tons in November, 1940; 2,571 tons in October, 1940; 2,434 tons in November, 1939; 25,668 tons during January-November, 1940; 21,681 tons during the same period of 1939.

PHOSPHATE ROCK OUTPUT AT NAURU UP 2 PER CENT

Production of phosphate rock at Nauru and Ocean Islands during the year ended June 30, 1940, was estimated at 1,247,000 tons, a gain of 2 per cent over the previous year and 8 per cent over 1937-38. About two-thirds of output occurred on Nauru Islands and the remainder on Ocean Islands, according to the Department of Commerce.

Exports were distributed as approximately as follows: Australia, 667,000 long tons; New Zealand, 404,000 tons; United Kingdom, 40,000 tons; and other countries, 126,000 tons. The British Phosphate Commission, entity operating the phosphate deposits at Nauru and Ocean Islands for the Governments of Australia, New Zealand and United Kingdom owned four vessels specially built for the distribution of phosphate rock.

NITROGANIC TANKAGE

Let us tell you about this new fertilizer material. We solicit inquiries.

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Urea Nitrogen Has an Impressive Record of Agronomic Efficiency!

THERE is a growing volume of evidence, both from experimental and actual farm use, to show the consistently high agronomic value of urea nitrogen.

The Agricultural Experiment Stations, realizing the growing importance of this form of nitrogen, some years ago began to include urea in their experimental programs. As a result, an increasing number of published reports are becoming available to prove that urea—the **completely-available, leaching-resistant** form of nitrogen—grows high yields of quality crops.

"URAMON" Fertilizer Compound
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(42% Urea Nitrogen)

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Urea-Ammonia Liquors
(Urea and Ammonia Nitrogen)

DU PONT

E. I. DU PONT DE NEMOURS & CO. (INC.)
AMMONIA DEPARTMENT **WILMINGTON, DELAWARE**

FACTS—OUR INDUSTRY'S BEST PROTECTION

(Continued from page 12)

out of each farm income dollar to pay for the fertilizer used. From 1929 to 1940, while tonnage of fertilizers declined three per cent, total plant food purchased by farmers in fertilizers increased eight per cent. At the same time, farm expenditures for fertilizers declined twenty-eight per cent as contrasted to a decline in farm cash income of twenty per cent.

The major objective of the Agricultural Adjustment Act is to restore farm purchasing power to the 1910-1914 average, to secure prices for farm products in relation to prices for farm purchases on a parity basis with the 1910-1914 period. That parity has more than been reached as to fertilizer prices. Today a dollar's worth of farm products will buy one dollar and three cents worth of fertilizers, although it will buy on an average only eighty-one cents worth of all other commodities purchased by farmers. These are facts about fertilizer prices.

Potential Returns from Fertilizer Use

In the consumer survey[3] conducted by The National Fertilizer Association, 32,000 farmers in thirty-five states were interviewed. The average yield and improved quality resulting from the use of fertilizer as found in that survey had a value for each dollar spent for fertilizer of four dollars and one cent in ten southern states and, for the entire United States, had an average value of three dollars and sixty cents. In the southern states the return for each dollar spent on fertilizer was four dollars and forty-eight cents for cotton, nine dollars and sixty cents for tobacco, one dollar and seventy-four cents for corn and three dollars and thirty-nine cents for other crops.

In Minnesota where very little fertilizer is used but which has soil as fertile as that in Maine, the average yield of potatoes per acre during the ten-year period 1927-1936 was seventy-seven bushels. In Maine where heavy fertilization is practiced, the average potato yield during the same ten-year period was two hundred and sixty-two bushels per acre.

Our Industry's Capacity to Produce

Farm income is one of the best barometers of fertilizer volume. Fertilizer tonnage moves up and down to just about the same relative extent as does farm income. When the total amount of cash income on farms is high, farmers purchase fertilizers in large quantities.

The eight hundred companies in the fertilizer industry have an approximate plant capacity of sixteen million tons a year. This is twice the volume that has ever been used in the country in any year. During any of the past few years, production has not exceeded fifty per cent of capacity.

Summary

Facts used constructively can help us serve fertilizer users still better. We of the fertilizer industry are going to find it to the benefit of those we serve as fertilizer users as well as a benefit to our industry to keep putting these facts before the public, placing our emphasis on constructive interpretation and calling to account those over-zealous and mis-informed individuals who make unwarranted statements concerning us and our activities as in the instance I have cited. The two surveys[4] of plant food consumption made—one for 1934 and the other for 1939—in which our Association played such an important part, are one of many ways in which we can continue to direct effort to keep ourselves up-to-date and looking forward to even better service. We have made commendable strides forward as records indicate but there is ahead of us an unending opportunity to do ever better. The product we make has an important and sound place in agricultural and national welfare. Its relative cost to users is lower than the parity period which has been assumed as a standard. Disturbed conditions of international commerce are not affecting our ability to serve well as they did in the years preceding 1920. We have

[3] American Fertilizer Practices—Second Survey, published by The National Fertilizer Association, 1939.

[4] A Survey of Plant Food Consumption in the United States for the year ended June 30, 1934, and a Survey of Plant Food Consumption in the year ended June 30, 1939. Both published by The National Fertilizer Association from statistics compiled by the United States Department of Agriculture and The National Fertilizer Association.

STEDMAN TYPE "S" POSITIVE MECHANICAL-TRAY
VIBRATING SCREENS

Designed especially for screening complete fertilizer. Write for complete illustrated descriptive bulletin No. 502 to solve your screening problems. Six sizes. Capacities 10 to 60 tons per hour.

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CONDITION OF FALL GRAINS

Winter Wheat

The acreage of winter wheat seeded in the fall of 1940 for harvest in 1941 is estimated at 46,271,000 acres. This is an increase of 5.6 per cent above the acreage seeded last fall. The 1939 acreage was 43,820,000 acres and the 10-year (1928-37) average is 47,807,000 acres. The acreage seeded this fall is above last year in all areas, exceeding last year by about 3 per cent in the central soft red winter wheat area, fully 5 per cent in the hard red winter wheat area, and about one-fifth in the soft wheat States of the northwest.

The condition of winter wheat on December 1, 1940, of 84 per cent is the highest since December 1, 1930, which preceded the big crop of 1931. This December's condition is high by comparison with the 55 per cent on December 1, 1939, and the 1928-37 average of 79 per cent. The margin above last year and above average is greatest in the Great Plains, Mountain and Pacific Norwest States.

Based on the past relationship between December 1st condition and yield per seeded acre, with some allowance for the probable effect of weather conditions during the past summer and fall, the indicated 1941 production of winter wheat is 633,000,000 bushels. In 1940 production was 589,151,000 bushels and the (1929-38) average production is 571,067,000 bushels.

Rye

The acreage of rye seeded in the fall of 1940 is estimated at 6,002,000 acres which is about 8½ per cent larger than the area seeded in the fall of 1939 but slightly smaller than the 10-year average seedings. These estimates include acreage seeded for pasture, soil improvement, etc., as well as acreage for harvest as grain. An allowance is made also for spring seedlings in areas where rye is spring sown.

The condition of rye on December 1, 1940, at 83 per cent of normal is far above the 64 per cent reported a year earlier and also is higher than the 10-year (1928-37) average of 78 per cent. The condition of the crop is uniformly good, being above average in most States.

Manufacturers Association Makes Tax Recommendations

At the recent Annual Congress of American Industry held at New York by the National Association of Manufacturers, the Committee on Government Finance recommended a drastic curtailment of all non-military governmental expenditures and a revision of the tax system to meet more adequately the cost of national defense.

Considering the limits of maximum taxation, the committee concluded that in view of the "possible need for additional taxes to finance the national defense program we face the question of what is the maximum tax load possible without hindering national productivity and individual welfare"; adding, "there is some evidence to show that only about one-quarter of national income may continue to be diverted to government without such interference when not actually engaged in war."

With a recommendation for defense program financing on a "pay-as-you-go" basis as far as this can be done without drying up sources of government revenue or restricting vital industry production, five changes in the present tax law are proposed in the report, as follows:

"With business profits already carrying a heavy load we suggest that this burden should be accompanied by certain changes in the present tax law which not only imposes unjust burdens but in some cases has the effect of taxing statutory, but actually non-existent profits. These recommended tax changes include:

1. Restoration of the right to file consolidated returns for normal income tax purposes.
2. Elimination of the double taxation of dividends received by corporations.

(Continued on page 26)

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Information and references available on request.

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Pioneer Producers of Muriate of Potash in America
See Page 4

THE INFLUENCE OF PLACEMENT UPON THE MOVEMENT OF FERTILIZER SALTS IN THE SOIL

(Continued from page 9)

band-placed treatment, samples taken in the row showed a marked increase in soluble salt concentration, indicating a heavy movement of salts from the band into this area, between bands. That potash salts were among those moving into this zone is shown by the high test for potassium found at this time. In the case of the "in row" treatment, no evidence of the movement of potash was found except for the lowering of the potash concentration in the center of the row after the second sampling. Plant utilization could hardly account for this. The center of the row samples showed a high test for potash for the first two samplings and then leveled off to show a medium test for all other samplings.

The results for ammonia nitrogen are identical with those for potash in both treatments. Here again there was evidence of movement to the zone between bands in the band-placed treatment, and no evidence of movement in the "in row" treatment.

All samples analyzed during this study gave a high test for nitrates. Since a heavy crop of crimson clover was plowed under on this land prior to planting the beans, nitrates would be

Table 1

The Effect of Band Placement Upon the Movement and Fixation of Fertilizer Salts in a Woodstown Sandy Loam Soil, 0-4 Inch Depth

Days after Planting	Distance from Center of Row (Inches)	Available P	Available K	Available NH_4	Available NO_3
5	0	Poor	Fair	Poor	Good
	2	Good	Good	Good	Very Good
	7	Poor	Fair	Poor	Good
19	0	Poor	Good	Fair	Very Good
	2	Fair	Good	Good	Very Good
	7	Poor	Fair	Poor	Good
35	0	Poor	Good	Fair	Very Good
	2	Poor	Fair	Poor	Good
	7	Poor	Fair	Poor	Good
53	0	Poor	Fair	Poor	Good
	2	Poor	Fair	Poor	Good
	7	Poor	Fair	Poor	Good

Table 2

The Effect of the "In Row" Method of Application Upon the Movement and Fixation of Fertilizer Salts in a Woodstown Sandy Loam Soil, 0-4 Inch Depth

Days after Planting	Distance from Center of Row (Inches)	Available P	Available K	Available NH_4	Available NO_3
5	0	Fair	Good	Good	Very Good
	2	Poor	Fair	Poor	Good
	7	Poor	Fair	Poor	Good
19	0	Poor	Good	Fair	Very Good
	2	Poor	Fair	Poor	Very Good
	7	Poor	Fair	Poor	Good
35	0	Poor	Fair	Poor	Very Good
	2	Poor	Fair	Poor	Good
	7	Poor	Fair	Poor	Good
53	0	Poor	Fair	Poor	Very Good
	2	Poor	Fair	Poor	Good
	7	Poor	Fair	Poor	Good

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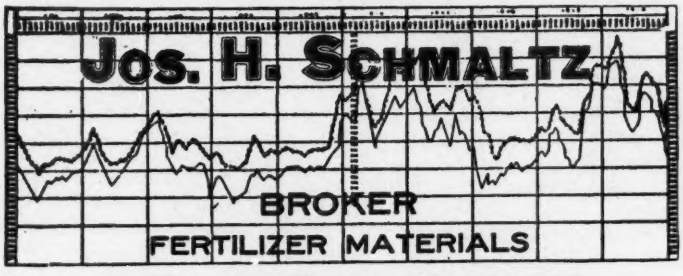

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expected to be present in large amounts. However, since nitrates are known to be among the most mobile ions found in the soil it would be expected that their movement would be in close agreement with the salt movement indicated in Table 1. This is shown by the "very good" tests reported in Tables 1 and 2.

Summary

A study of the effect of two methods of placement upon the movement of fertilizer salts in the soil is reported.

CROP PRODUCTION, 1940

(Continued from page 7)

of the central and eastern Gulf States, however, growing conditions were generally unfavorable and several crops grown extensively in this area show below-average yields, particularly sugarcane, sweet potatoes, sorgo for sirup, cowpeas, and velvet beans.

A composite of yields per acre of field and fruit crops shows that they were 118.5 per cent of the 1923-32 or "pre-drought" average, compared with previous high records of 117.7 in 1937, between 113 and 114 in 1938 and 1939, 108.8 in 1920 and 104.3 in 1928. In contrast to these high years, crop yields in 1934 were only 81 per cent of the pre-drought average. The 1934 drought also reduced the acreage harvested about 17 per cent below the usual level.

MANUFACTURERS ASSOCIATION MAKES TAX RECOMMENDATIONS

(Continued from page 22)

3. Relief from normal taxes of dividends received by individuals.

4. Repeal of the declared-value excess profits tax and related capital stock tax.

5. Extension of the two year loss carry-over period to five years."

Excess Profits

On the new excess profits tax, the committee report stated:

"As a matter of basic tax principle no corporation should be discriminated against merely because of size. To protect the small stockholders in the larger corporations who may be penalized through the existing method of levying excess profits taxes on dollar amounts of income, an optional method should be included in the law. Under this option companies could apply graduated rates on various percentage increases in income above the average earning base. Such an option was included in the Second Revenue Bill of 1940 as passed by the Senate and could easily be written into the present law.

"The existing law also discriminates against the average earnings method of computing excess profits taxes. While this discrimination is comparatively small—a 5% reduction in the average earnings base—as a matter of principle such discrimination is inequitable and should be removed from the law."

The existing method of computing invested capital which requires daily computation of assets represents a practically impossible task and should be amended. It is recommended that this amendment of the method of determining invested capital under usual circumstances should require only the computation of assets at the beginning and end of the taxable year.

In conclusion, the report called for two amendments to the amortization provisions of the Second Revenue Act of 1940 designed to stimulate the expansion of defense facilities by providing for the rapid write-off of factories and machinery which will be useless after the emergency is over. These are:

1. Extension of the amortization privilege to individuals and partnerships engaged in business instead of limiting this privilege to corporate enterprises.

2. Amendment of Section 124 (f) (3)—relating to the date which the amortization certificate must have in order to be effective—so that after February 5, 1941, there shall be some practical way of securing a certificate within a reasonable period after the beginning of construction or the date of acquisition. Such amendment should also provide that the amortization certificate be dated as of the time of application by the taxpayer rather than the date of issuance by the War or Navy Department and the National Defense Advisory Commission.

Books on Agriculture and Fertilizers

Commercial Fertilizers

By GILBERT H. COLLINGS, PH.D., Associate Professor of Agronomy, Clemson Agricultural College. A modern, complete study of all fertilizer problems, well illustrated. The book gives actual research data, and the work of many agronomists, chemists and engineers has been reviewed. Each chapter has been read by authorities connected with organizations producing or marketing the products discussed; thus it represents a composite of the best opinions and conclusions in the fertilizer industry. 365 pages. 85 illustrations. Price $4.00.

Handbook of Fertilizers

By A. F. GUSTAFSON, PH.D., Professor of Soil Technology, Cornell University. A revised edition of this popular treatise. Covers the sources, character and composition of fertilizers and fertilizer materials. The food requirements of different crops and the effects of different fertilizers. A valuable volume for fertilizer manufacturers and salesmen, county agents, agricultural teachers, farmers and truckers. 172 pages. 5 x 8. Price $1.75.

Manures and Fertilizers

By H. J. WHEELER. A clear and unusually full discussion of the practical utilization of manures and fertilizers of all kinds and of their relations to the plant and to the soil. 389 pages. 5½ x 7½. Illustrated. Price $2.75.

Phosphoric Acid, Phosphates and Phosphatic Fertilizers

By W. H. WAGGAMAN. A comprehensive treatise, covering completely the subjects of phosphoric acid and phosphate—the sources, the processes of treatment, the products obtained, and their uses in agriculture and the arts. The volatilization process for producing phosphoric acid is fully discussed. In addition to the use of phosphate as a fertilizer material, there are chapters on phosphate baking powders, phosphate water softeners, and miscellaneous uses. This book is one of the American Chemical Society's technologic monographs and contains extended references to the literature, which facilitates further study of the subject. 366 pages. Price $5.75.

Potash Deficiency Symptoms

By OSKAR ECKSTEIN, ALBERT BRUNO AND J. W. TURRENTINE. A revised edition which explains in detail the signs of potash deficiency in all the important cultivated crops as shown in appearance and structure of leaf, root, fruit, etc.; also the influence of a lack of potash on resistance to plant diseases, pests and climatic factors. Printed in English, French and German. Profusely illustrated with 55 color plates and 41 black and white engravings. 248 pages. 7 x 9½. Price $2.25.

Potash: A Review, Estimate and Forecast

By J. W. TURRENTINE, M.S., PH.D., in charge of Potash Investigations, Bureau of Soils, U. S. Department of Agriculture. This book, written by an authority on the subject, covers in detail the American and foreign potash industry. This book deals with the technology of potash manufacture from numerous raw materials; the occurrence, properties and relative values of various potash minerals and the technology of extraction; the technology of utilizing potash-bearing industrial wastes for the manufacture of potash salts. European and other foreign sources of supply are given special attention. 188 pages. 6 x 9. Illustrations and tables. Price $3.00.

Soil Management

By FIRMAN E. BEAR, PH.D. This is a revised and enlarged edition of a book which was an accepted text book in schools with agricultural courses, and which also enjoyed a wide general circulation. The author has made a study of soils for many years, both in this country and in Europe. The 26 chapters cover five divisions of the subject—requirements of soils, characteristics of soils, utilizing soil resources and supplementing soil resources. The last division treats most effectively of fertilizers. 412 pages. 6 x 9. 58 figures. Price $3.50.

Sulphuric Acid Manufacture

By ANDREW M. FAIRLIE. This volume covers thoroughly the production of sulphuric acid from its earliest beginnings to the latest developments in both chamber and contact systems. Modern apparatus, plant construction and production methods are described in detail, with numerous illustrations. Other chapters are also included on the production of raw materials as well as the uses, handling methods, cost accounting methods, etc., of the finished product. An American Chemical Society Monograph. 632 pages. 6 x 9. Price $9.75.

Theory and Practice in the Use of Fertilizers

By FIRMAN E. BEAR, PH.D. Second revised edition, covering the progress in the manufacture and use of fertilizers during recent years. The history of the science of fertilizers from the time of Jethro Tull to the present era. Fertilizer practice, both in Europe and America, is completely examined. The various schemes that have been proposed for determining what fertilizers to use are thoroughly treated. A comparison of fertilizers and their relative values is made. Also, there are concise statements of determining the fertilizer needs, and specific suggestions as to the use of fertilizers. 360 pages. 6 x 9. Price $4.00.

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A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

This list contains representative concerns in the Commercial Fertilizer Industry, Including fertilizer manufacturers, machinery and equipment manufacturers, dealers in and manufacturers of commercial fertilizer materials and supplies, brokers, chemists, etc.
For Alphabetical List of Advertisers, see page 33.

ACID BRICK
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

ACID EGGS
Chemical Construction Corp., New York City.

ACIDULATING UNITS
Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

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American Cyanamid Co., New York City.

AMMONIA—Anhydrous
Barrett Company, The, New York City.
Du Pont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.

AMMONIA LIQUOR
Barrett Company, The, New York City.
Du Pont de Nemours & Co., E. I., Wilmington, Del.
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AMMONIA OXIDATION UNITS
Chemical Construction Corp., New York City.

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Sackett & Sons Co., The A. J., Baltimore, Md.

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Link-Belt Company, Philadelphia, Chicago.
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BABBITT
Sackett & Sons Co., The A. J., Baltimore, Md.

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BAGS—Cotton
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BAGS—Paper
Bagpak, Inc., New York City.
Bemis Bro. Bag Co., St. Louis, Mo.

BAGS (Waterproof)—Manufacturers
Bemis Bro. Bag Co., St. Louis, Mo.
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Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

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Atlanta Utility Works, East Point, Ga.
Bagpak, Inc., New York City.
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BAG-CLOSING MACHINES
Bagpak, Inc., New York City.

BAG PILERS
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Link-Belt Company, Philadelphia, Chicago.

BEARINGS
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BELTING—Chain
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

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Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.

BOILERS—Steam
Atlanta Utility Works, East Point, Ga.

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American Agricultural Chemical Co., New York City.
Armour Fertilizer Work, Atlanta, Ga.
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Jett, Joseph C., Norfolk, Va.
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Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.

BURNERS—Sulphur
Chemical Construction Corp., New York City.

BURNERS—Oil
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.

CABLEWAYS
Hayward Company, The, New York City.

CALCIUM-NITRATE
Synthetic Nitrogen Products Co., New York City.

CAL-NITRO
Synthetic Nitrogen Products Co., New York City.

CARBONATE OF AMMONIA
American Agricultural Chemical Co., New York City.
Du Pont de Nemours & Co., E. I., Wilmington, Del.

CARS—For Moving Materials
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CARTS—Fertilizer, Standard and Roller Bearing
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

CASTINGS—Acid Resisting
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

CASTINGS—Iron and Steel
Jeffrey Manufacturing Co., The, Columbus, Ohio.
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Stedman's Foundry and Mach. Works, Aurora, Ind.

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Huber & Company, New York City.
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Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

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Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.
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DUMP CARS
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

DUST COLLECTING SYSTEMS
Sackett & Sons Co., The A. J., Baltimore, Md.

ELECTRIC MOTORS AND APPLIANCES
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ELEVATORS AND CONVEYORS—Portable
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ENGINES—Steam
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

EXCAVATORS AND DREDGES—Drag Line and Cableway
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corp., Chicago, Ill. and Cedar Rapids, Iowa.

FERTILIZER MANUFACTURERS
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Farmers Fertilizer Co., Columbus, Ohio.
International Agricultural Corp., New York City.
Smith-Rowland Co., Norfolk, Va.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

FOUNDERS AND MACHINISTS
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GARBAGE TANKAGE
Wellmann, William E., Baltimore, Md.

GEARS—Machine Moulded and Cut
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GEARS—Silent
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

GELATINE AND GLUE
American Agricultural Chemical Co., New York City.

GUANO
Baker & Bro., H. J., New York City.

HOISTS—Electric, Floor and Cage Operated, Portable
Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.

HOPPERS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Wellmann, William E., Baltimore, Md.

IRON SULPHATE
Tennessee Corporation, Atlanta, Ga.

INSECTICIDES
American Agricultural Chemical Co., New York City.

LACING—Belt
Sackett & Sons Co., The A. J., Baltimore, Md.

LIMESTONE
American Agricultural Chemical Co., New York City.
American Limestone Co., Knoxville, Tenn.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Wellmann, William E., Baltimore, Md.

LOADERS—Car and Wagon, for Fertilizers
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Coal and Ash Handling
Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Elevating and Conveying
Atlanta Utility Works, East Point, Ga.
Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
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MACHINERY—Power Transmission
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MACHINERY—Pumping
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MACHINERY—Tankage and Fish Scrap
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MAGNESIA
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MANGANESE SULPHATE
Tennessee Corportion, Atlanta, Ga.

MIXERS
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Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

NITRATE OF SODA
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Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
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Huber & Company, New York City.
International Agricultural Corp., New York City.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

NITRATE OVENS AND APPARATUS
Chemical Construction Corp., New York City.

NITROGENOUS ORGANIC MATERIAL
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Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Du Pont de Nemours & Co., E. I., Wilmington, Del.
Huber & Company, New York City.
International Agricultural Corp., New York City.
Smith-Rowland Co., Norfolk, Va.
Wellmann, William E., Baltimore, Md.

NOZZLES—Spray
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PACKING—For Acid Towers
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

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Ruhm, H. D., Mount Pleasant, Tenn.
Schmaltz, Jos. H., Chicago, Ill.
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Taylor, Henry L., Wilmington, Del.
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PIPES—Chemical Stoneware
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PIPES—Wooden
Stedman's Foundry and Mach. Works, Aurora, Ind.

PLANT CONSTRUCTION—Fertilizer and Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
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POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Agricultural Corp., New York City.
Jett, Joseph C., Norfolk, Va.
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Synthetic Nitrogen Products Co., New York City.
Taylor, Henry L., Wilmington, Del.
Wellmann, William E., Baltimore, Md.

POTASH SALTS—Manufacturers and Importers
American Potash and Chem. Corp., New York City.
Potash Co. of America, Baltimore, Md.
United States Potash Co., New York City.

PULLEYS AND HANGERS
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

PUMPS—Acid-Resisting
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Monarch Mfg. Works, Inc., Philadelphia, Pa.

PYRITES—Brokers
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Baker & Bro., H. J., New York City.
Jett, Joseph C., Norfolk, Va.
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Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

RINGS—Sulphuric Acid Tower
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SCRAPERS—Drag
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Hayward Company, The, New York City.
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SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SEPARATORS—Including Vibrating
Link-Belt Company, Philadelphia, Chicago.
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Sackett & Sons Co., The A. J., Baltimore, Md.
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Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
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SHOVELS—Power
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corp., Chicago, Ill. and Cedar Rapids, Iowa.
Sackett & Sons Co., The A. J., Baltimore, Md.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SPROCKET WHEELS (See Chains and Sprockets)

STACKS
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Ashcraft-Wilkinson Co., Atlanta, Ga.
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Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
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SUPERPHOSPHATE
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Ashcraft-Wilkinson Co., Atlanta, Ga.
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Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Wellmann, William E., Baltimore, Md.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Agricultural Corp., New York City.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SYPHONS—For Acid
Monarch Mfg. Works, Inc., Philadelphia, Pa.

TALLOW AND GREASE
American Agricultural Chemical Co., New York City.

TANKAGE
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
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Baker & Bro., H. J., New York City.
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Smith-Rowland Co., Norfolk, Va.
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Wellmann, William E., Baltimore, Md.

TANKAGE—Garbage
Huber & Company, New York City.

TANKS
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.

TILE—Acid-Proof
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

TOWERS—Acid and Absorption
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

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Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
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UREA
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UREA-AMMONIA LIQUOR
Du Pont de Nemours & Co., E. I., Wilmington, Del.

VALVES—Acid-Resisting
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
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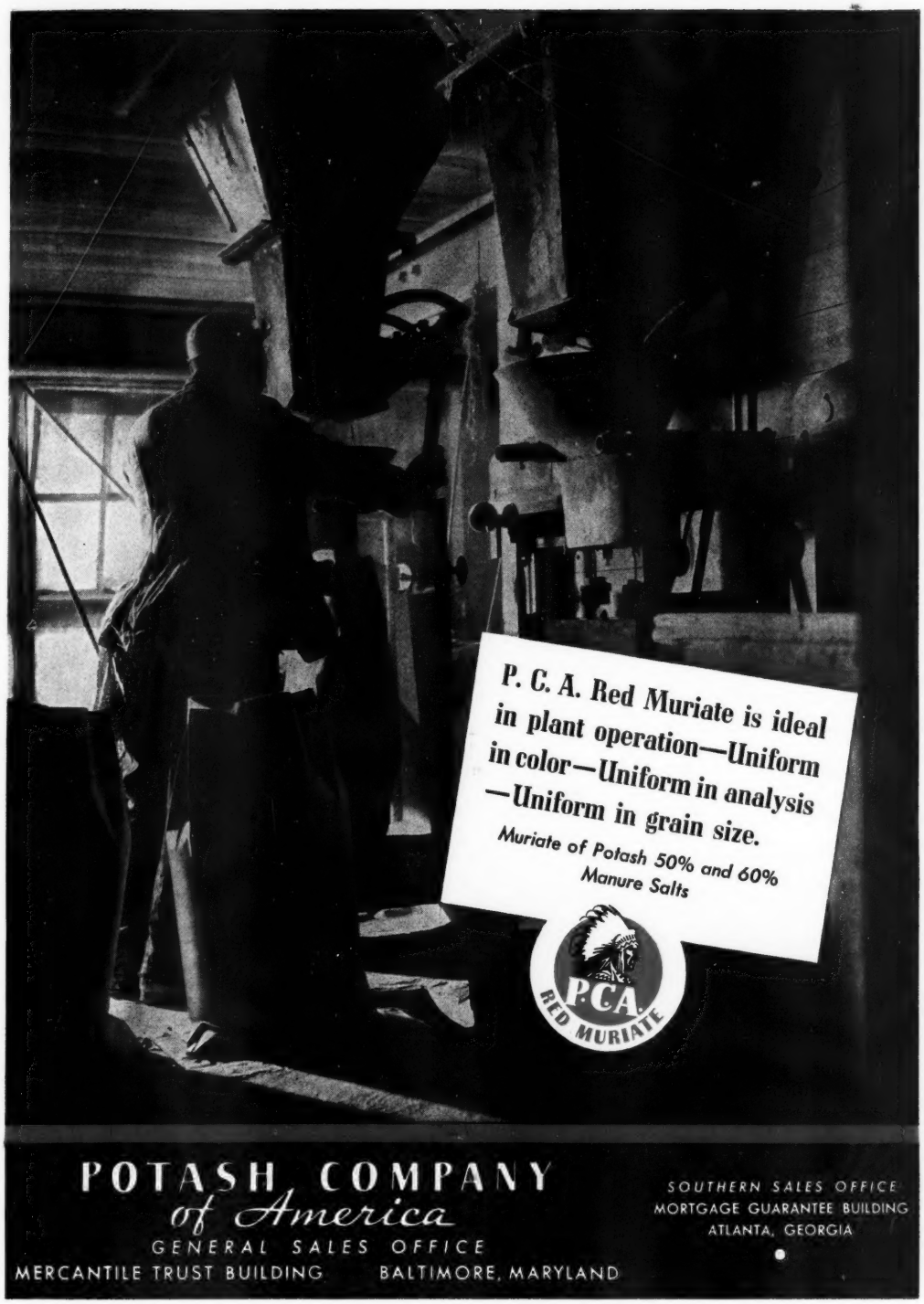
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